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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/066,463 | 01/31/2002 | Hideaki Kurihara | FUJO 19.398 | 2188 |

7590 05/23/2002

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EXAMINER

LERNER, MARTIN

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 2654 | |

DATE MAILED: 05/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/066,463 | KURIHARA ET AL. | |
| Examiner | Art Unit | | |
| Martin Lerner | 2654 | | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1 to 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1 to 12 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 31 January 2002 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) Interview Summary (PTO-413) Paper No(s). _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

Drawings

1. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
2. The drawings are objected to because in Figure 14C, "LAWERING" should be — LOWERING—. (Two occurrences) A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The abstract of the disclosure is objected to because it is more than 150 words. Correction is required. See MPEP § 608.01(b).
4. The disclosure is objected to because of the following informalities:
 - On page 2, line 25, "track" should be —tract—. Similarly, on page 4, line 2; page 4, line 21, and in the Abstract, line 10, "track" should be —tract—.
 - On page 8, line 4, "is" should be deleted.
 - On page 30, line 3, "AT" should be —At—.Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

Claims 1, 5 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by *Morii ('421)*.

Regarding independent claims 1, 5, and 9, *Morii ('421)* discloses a speech coding apparatus, method and computer program with variable coding rates, comprising:

"a judging unit for judging whether a voice signal is a vowel when a voice part of a voice signal is sounded" – when a voice or speech is received in the input speech receiving unit 12, the voice or speech is converted into a plurality of digital speech signals, and each of the digital speech signals is processed in the speech analyzing unit 20; a set of characteristic parameters indicates that the digital analyzing signal corresponds to a particular speech portion such as a vowel stationary portion of a vowel of the voice or a vowel transitional portion of a vowel of the voice (column 17, line 64 to column 18, line 26: Figure 5);

"a rate setting unit setting a voice encoding bit rate at bit rate lower than the bit rate usually used when the voice part is sounded if the voice signal is a vowel" – an estimating result for selection of the appropriate coding module based on the neural

network is described; in this estimation, five coding modules operating according to the CELP coding method are arranged in the coding unit 19; coding module M1 is appropriate for a vowel transitional portion and a voiced consonant and has a bit rate of 8 kbps; coding module M2 is appropriate for an affricative of the voiceless consonant and has a bit rate of 8 kbps; coding module M3 is appropriate for a vowel stationary portion and has a bit rate of 4 kbps; coding module M4 is appropriate for a fricative of a voiceless consonant and has a bit rate of 4 kbps; and coding module M5 is appropriate for a silent portion and has a bit rate of 2kbps (column 18, lines 27 to 53: Figure 5); thus, the bit rate for a stationary vowel is 4 kbps as coded by coding module M3, which is a lower bit rate than the full bit rate for a voiced consonant of 8 kbps as coded by coding module M1.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2 to 4, 6 to 8, and 10 to 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Morii* ('421) in view of *Taguchi*.

Concerning claims 2, 6, and 10, *Morii* ('421) discloses a neural network which is taught to recognize characteristic parameters of a speech signal as voiced vowels, consonants, and silence through linear prediction coefficient (LPC) analysis. *Morii*

('421) omits calculating LSP coefficients, and judging whether an interval between LSP coefficients is equal to or less than a prescribed threshold. However, it is well known that line spectral pairs (LSP) are an alternative way to characterize speech parameters to linear prediction coefficients (LPC).

Taguchi teaches a speech coder which matches patterns of LSP coefficients to classify a predetermined section of speech at transitional parts of a vowel or consonant so that information compression can be attained through variable frame lengths.

(Column 1, Lines 9 to 39) A frequency interval sensitivity W_w ("an interval between the LSP coefficients") is one of the parameters which must be subjected to pattern matching. (Column 12, Lines 27 to 55: Figure 4A) Whether or not the frequency has a period below a predetermined frequency interval ("less than a prescribed threshold") will be decided on each reference pattern to determine which distance measure is used.

(Column 14, Lines 14 to 58) *Taguchi* suggests that a more accurate spectral distance measure to identify transition portions is obtained with a frequency interval sensitivity W_w . (Column 3, Lines 21 to 30)

It would have been obvious to one of ordinary skill in the art to utilize the variable coding method of *Taguchi* for matching patterns of LSP coefficients against a threshold, instead of the variable coding method of *Morii* ('421) where a neural network identifies speech portions from LPC coefficients, for the purpose of more accurately measuring the spectral distance.

Concerning claims 3, 7, and 11, *Morii* ('421) discloses a neural network which is taught to recognize characteristic parameters of a speech signal as voiced vowels,

consonants, and silence through linear prediction coefficient (LPC) analysis. *Morii* ('421) omits determining whether adjacent LSP coefficients do not move and exist within a prescribed range for a specific time period to judge if the voice signal is a vowel.

However, *Taguchi* teaches a speech coder which matches patterns of LSP coefficients to classify a predetermined section of speech at transitional parts of a vowel or consonant so that information compression can be attained through variable frame lengths. (Column 1, Lines 9 to 39) A frequency interval sensitivity W_w ("an interval between the LSP coefficients") is one of the parameters which must be subjected to pattern matching. (Column 12, Lines 27 to 55; Figure 4A) Frequency interval sensitivity W_w is determined on a frequency interval of the first and second LSP parameters. The frequency interval must be below a predetermined value ("within a prescribed range") for the length of a frame ("for a specific time period") so as to find out whether the section is inclined or flat. Non-inclined (flat) sections are coded with variable frame lengths. (Column 4, Lines 29 to 47; Column 14, Lines 55 to 58) *Taguchi* suggests that a more accurate spectral distance measure to identify transition portions is obtained by using the frequency interval sensitivity. (Column 3, Lines 21 to 30)

It would have been obvious to one of ordinary skill in the art to utilize the method of *Taguchi* for determining whether LSP coefficients are below a predetermined value for the length of a frame for the purpose of identifying whether the speech segment is a vowel in *Morii* ('421) in order to more accurately measure the spectral distance.

Concerning claims 4, 8, and 12, *Morii* ('421) discloses a neural network which is taught to recognize characteristic parameters of a speech signal as voiced vowels,

consonants, and silence through linear prediction coefficient (LPC) analysis in order to lower the encoding bit rate for vowels. *Morii* ('421) omits templates for identifying vowels with LSP coefficients.

However, *Taguchi* teaches a speech coder which matches patterns of LSP coefficients against reference patterns ("templates") to classify predetermined sections of speech at transitional parts of a vowel or consonant so that information compression can be attained through variable frame lengths. A minimum spectral distance indicates that the LSP coefficient is identified with ("approximately equal to") the matched reference pattern. (Column 1, Lines 9 to 39; Column 11, Line 49 to Column 13, Line 59: Figure 4A) Matching of reference patterns is a known alternative to identification by a trained neural network in the art of recognition.

It would have been obvious to one of ordinary skill in the art to identify vowels in order to change the encoding bit rate in *Morii* ('421) by comparing LSP coefficients to reference patterns as taught by *Taguchi* because this is a known alternative method of pattern recognition to identification by a trained neural network.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Morii ('846) and Kang et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-

9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha Banks-Harold can be reached on (703) 305-4379. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

ml

May 14, 2002

Marsha Banks-Harold
5/18/02